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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/507,280	11/29/2004	Enrique Garcia-Caurel	GARCIA-CAUREL	4225
545 7590 01/18/2007 ROGER PITT KIRKPATRICK & LOCKHART PRESTON GATES ELLIS LLP 599 LEXINGTON AVENUE 33RD FLOOR NEW YORK, NY 10022-6030			EXAMINER ALLI, IYABO	
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SHORTENED STATUTORY PERIOD OF RESPONSE		MAIL DATE	DELIVERY MODE	
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**Please find below and/or attached an Office communication concerning this application or proceeding.**

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

## Office Action Summary

Application No.

10/507,280

Applicant(s)

GARCIA-CAUREL ET AL.

Examiner

IYABO S. ALLI

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED. (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☒ Responsive to communication(s) filed on 11/29/2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-24 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-24 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 10 September 2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 07/19/2005.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Claim Rejections - 35 USC § 112***

1. Claim 5 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
2. Regarding claim 5, the phrase "such as" renders the claim indefinite because it is unclear whether the limitations following the phrase are part of the claimed invention. See MPEP § 2173.05(d).

"If upon review of the claim as a whole in light of the specification, the examiner determines that a rejection under 35 U.S.C. 112, second paragraph, is not appropriate in the above-noted example, but is of the opinion that the clarity and the precision of the language can be improved by the deletion of the phrase "such as" in the claim, the examiner may make such a suggestion to the applicant."

### ***Claim Rejections - 35 USC § 101***

3. 35 U.S.C. 101 reads as follows:

Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

4. Claims 5 & 6 are rejected under 35 U.S.C. 101 because the claimed invention is directed to non-statutory subject matter.

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5. In regards to claim 5, The method of "the incident light beam is modulated by a phase modulator at a frequency  $\omega$ , the intensity  $I(t)$  measured by the detection means as a function of the modulation amplitude  $\delta(t)$  is:  $I(t) = I_0 + I_s \sin(\delta(t)) + I_c \cos(\delta(t))$  where  $I(t) = A_0 + A_1 \sin t + A_2 \cos t$  a first Fourier-transform processing means analyses the signal  $I(t)$  into Fourier components  $S_0(\omega)$ ,  $S_1(\omega)$ ,  $S_2(\omega)$  at frequency  $\omega$  and at frequency  $2\omega$ , second processing means produces values  $I_0$ ,  $I_s$ ,  $I_c$  from the measured harmonics  $S_0(\omega)$ ,  $S_1(\omega)$ ,  $S_2(\omega)$  according to the following relation: 
$$\begin{pmatrix} S_0(\omega) \\ S_1(\omega) \\ S_2(\omega) \end{pmatrix} = \begin{pmatrix} J_0(A) \\ J_1(A) \\ J_2(A) \end{pmatrix} \begin{pmatrix} C_{c,0} \\ C_{s,\omega} \\ C_{s,2\omega} \end{pmatrix} + \begin{pmatrix} T_1 \\ T_2 \end{pmatrix} \begin{pmatrix} I_0 \\ I_s \\ I_c \end{pmatrix}$$
 where  $J_0$ ,  $J_1$  and  $J_2$  are the Bessel functions of order 0, 1, 2;  $T_1$  and  $T_2$  are specific constant of the detection means and  $C_{c,0}$ ,  $C_{s,\omega}$ ,  $C_{s,2\omega}$  describe the weak coupling between the three Fourier components, the modulation amplitude  $A$  being generally chosen such as  $J_0(A) + C_{c,0} = 0$ ;  $S_1(\omega) \approx T_1 I_s + C_{s,\omega} I_0$ ;  $S_2(\omega) \approx T_2 I_c + C_{s,2\omega} I_0$ . The spectroscopic variations of  $(T_1, T_2)$  and  $(C_{c,0}, C_{s,\omega}, C_{s,2\omega})$  are calculated by fitting a polynomial variation to the experimental values measured with the orientations of said polarisation state generator, modulator and polarisation state detector, being respectively P, M and A, said calibration is performed according to the

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configurations  $P-M = \pm 45^\circ$ ;  $A = 0^\circ, 90^\circ$ ;  $M = \pm 45^\circ$ . and  $P-M = \pm 45^\circ$ ;  $A = 45^\circ$ ;  $M = 45^\circ$ , third processing means produces the value  $\psi$  and  $\Delta$  from  $I_{00}$ ,  $I_s$ , and  $I_c$  according to simple trigonometric formulae, a method of polarimetric measurement according to claim 5, wherein a fourth degree polynomial is used for fitting the experimental values ( $T_1$ ,  $T_2$ ,  $C_{c0}$ ,  $C_{s0}$ ,  $C_{s\omega}$  and  $C_{s2\omega}$ ); and

**In regards to claim 6**, “wherein a fourth degree polynomial is used for fitting the experimental values ( $T_1$ ,  $T_2$ ,  $C_{c0}$ ,  $C_{s0}$ ,  $C_{s\omega}$  and  $C_{s2\omega}$ ),” does not produce a tangible result. The practical application of the claimed invention cannot be realized until the information is conveyed to the user. For the results to be tangible, it would need to output the information to a user, display it for a user, stored for later use, or used in a tangible manner. Merely determining, selecting, calculating, evaluating, converting would not appear to be sufficient to constitute a tangible result, since the outcome of the method has not been used in a disclosed practical application nor made available in such a manner that its usefulness in a disclosed practical application can be realized.

“The claimed invention as a whole must be useful and accomplish a practical application. That is, it must produce a “useful, concrete and tangible result.” State Street, 149 F.3d at 1373-74, 47 USPQ2d at 1601-02. The purpose of this requirement is to limit patent protection to inventions that possess a certain level of “real world” value, as opposed to subject matter that represents nothing more than an idea or concept, or is simply a starting point for future investigation or research (Brenner v. Manson, 383 U.S. 519, 528-36, 148 USPQ 689, 693-96 (1966)); In re Fisher, 421

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F.3d 1365, 76 USPQ2d 1225 (Fed. Cir. 2005); In re Ziegler, 992 F.2d 1197, 1200-03, 26 USPQ2d 1600, 1603-06 (Fed. Cir. 1993)). “

### ***Claim Objections***

6. Claim 21 is objected to because of the following informalities: there is an “I” in the claim where it should read “in”. Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

8. Claims 1-4, 8, 9, 13-18, 24 are rejected under 35 U.S.C. 102(b) as being anticipated by **Woollam et al.** (6,982,792).

Woollam discloses a spectrophotometer, ellipsometer, polarimeter and the like systems comprising:

In regards to claim 1, a method of polarimetric measurement of a sample (SS) represented by the coefficients of a Mueller matrix (Column 48, lines 6-9), in which the sample (SS) located inside an air tight chamber (CH) is illuminated by a polarized incident light beam produced by a polarization state generator (PSG) (Column 32, lines 14-17 and Fig. 7c);

said beam being reflected by the sample (**SS**), analyzed by a polarization state detector (PSD) and then measured by detection means (**DET**) being located in at least an air tight chamber (**CH**) (Column 22, lines 18-22 and Fig. 1a);

wherein, one illuminates the sample (**SS**) with a light beam in the spectral range from the far ultraviolet to the visible (Column 23, lines 9-12 and Fig. 1b);

one extracts the coefficients of the Mueller matrix from polarimetric measurements performed under a low partial pressure of far ultraviolet highly absorbing gases (Column 48, lines 1-12); and

one evacuates far ultraviolet highly absorbing gases by pumping down said chambers (**CH**) (Column 58, lines 1-6).

**In regards to claim 2**, one evacuates far ultraviolet highly absorbing gases by pumping down said chambers (**CH**) and then refilling said chambers (**CH**) with far ultraviolet non-absorbing gas (Column 58, lines 4-13).

**In regards to claim 3**, the energy range of the incident light beam emitted by the excitation section is between 1.5 and 9.5 eV (Column 5, lines 14-16).

**In regards to claim 4**, the parameters representative of the sample (**SS**) are measured by ellipsometry (Column 28, lines 1-5).

**In regards to claim 8**, polarimetric system for analyzing a sample (**SS**) comprising an excitation section emitting a light beam, said excitation section comprising a polarization state generator (**PSG**) and optical means to focus said beam on the sample (**SS**), a sample holder (**STG**) (Column 33, lines 7-10 and Fig. 8c);

an analysis section comprising a polarization state detector (**PSD**), detection means, wherein the light beam emitted by the excitation section is in the spectral range far from the far ultraviolet to the visible, the light beam propagates through the excitation section up to through the analysis section under a low partial pressure of far ultraviolet absorbing gases (Column 44, lines 6-12);

the polarimetric system comprises at least an air tight chamber (**CH**), said chambers containing said excitation section, said analysis section and the sample holder (**STG**) (Column 33, lines 7-10 and Fig. 8c);

and said chambers (**CH**) comprise a pumping station and pressure monitoring means (Column 54, lines 2-13).

**In regards to claim 9**, chambers (**CH**) are interconnected so as to form a unique chamber (Column 32, lines 12-14 and Fig. 7c).

**In regards to claim 13**, the polarimetric system comprises a source of far ultraviolet non absorbing gases and means for introducing and evacuating said gases into said chambers (Column 58, lines 3-12).

**In regards to claim 14**, said gases comprise nitrogen ( $N_2$ ) (Column 19, lines 9-10).

**In regards to claim 15**, the sample holder (**STG**) comprises means for tilting said sample holder (**STG**) controlled by external means (Column 62, lines 10-12).



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**In regards to claim 16**, the excitation section comprises a monochromator (**M**) positioned before the polarizer (**P**) (Fig. 1b).

**In regards to claim 17**, the detection means (**DET**) comprises a monochromator (**M**) (Column 26, lines 1-5).

**In regards to claim 18**, a slit is positioned at the entrance of said monochromator and focusing means focuses the beam onto the said entrance slit (Column 35, lines 16-20).

**And in regards to claim 24**, said polarimetric system is an ellipsometer (Column 28, lines 1-3).

***Claim Rejections - 35 USC § 103***

9. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

10. Claims 5 & 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Woollam et al.** (6,982,792) in view of **Johs et al.** (6,804,004).

**Woollam et al.** 's invention discloses all of the claimed limitations above except a method of polarimetric measurement according to claim 4, wherein the incident light beam is modulated by a phase modulator at a frequency  $\omega$ , the intensity  $I(t)$  measured by the detection means as a function of the

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modulation amplitude  $\Delta(t)$  is:  $I(t) = I_0 + I_s \sin(\Delta(t)) + I_c \cos(\Delta(t))$  where  $\Delta(t) = A_0 + A_1 \sin t + \sum_{n=2}^{\infty} A_n \sin(n t + \phi_n)$  a first Fourier-transform processing means analyses the signal  $I(t)$  into Fourier components  $S_0(\text{dc})$ ,  $S_1$ ,  $S_2$  at frequency  $\omega$  and at frequency  $2\omega$ , second processing means produces values  $I_0$ ,  $I_s$ ,  $I_c$  from the measured harmonics  $S_0$ ,  $S_1$ ,  $S_2$  according to the following relation: 
$$\begin{pmatrix} S_0 \\ S_1 \\ S_2 \end{pmatrix} = I \begin{pmatrix} 1 & 0 & 0 \\ 0 & 2 & T_1 J_1(A) \\ 0 & 0 & 2 T_2 J_2(A) \end{pmatrix} \begin{pmatrix} 1 \\ 0 \\ 1 \end{pmatrix} \begin{pmatrix} c \\ s \\ 0 \end{pmatrix} + C \begin{pmatrix} c \\ 0 & 0 & 1 \\ c \\ 0 & c \\ s, 2 & 1 \end{pmatrix} \begin{pmatrix} 1 & 0 & 1 \\ s & 1 & c \end{pmatrix}$$
 where  $J_0$ ,  $J_1$  and  $J_2$  are the Bessel functions of order 0, 1, 2;  $T_1$  and  $T_2$  are specific constant of the detection means and  $C_{c,0}$ ,  $C_{s,0}$ ,  $C_{s,\omega}$  and  $C_{s,2\omega}$  describe the weak coupling between the three Fourier components, the modulation amplitude  $A$  being generally chosen such as  $J_0(A) + C_{c,0} = 0$ :

$S_{\omega} \approx T_1 I_s + C_{s,\omega} I_c - A I_c$

$S_{2\omega} \approx T_2 I_c + C_{s,2\omega} I_s$  The spectroscopic variations of  $(T_1, T_2)$  and  $(C_{c,0}, C_{s,0}, C_{s,\omega}$  and  $C_{s,2\omega})$  are calculated by fitting a polynomial variation to the experimental values measured with the orientations of said polarisation state generator, modulator and polarisation state detector, being respectively P, M and A, said calibration is performed according to the configurations P-M=+/-45.degree.; A=0.degree., 90.degree.; M=+/-45.degree. and P-M=+/-45.degree.; A=45.degree.; M=45.degree., third processing means produces the value  $\psi$  and  $\Delta$  from  $I_0$ ,  $I_s$ , and  $I_c$  according to simple trigonometric

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formulae and a forth degree polynomial is used for fitting the experimental values ( $T_1$ ,  $T_2$ ,  $C_{c,0}$ ,  $C_{s,0}$ ,  $C_{s,\omega}$ , and  $C_{s,2\omega}$ ).

However, **Johs et al.** teaches in regards to claim 5, a method of polarimetric measurement according to claim 4, wherein the incident light beam is modulated by a phase modulator at a frequency  $\omega$ , the intensity  $I(t)$  measured by the detection means as a function of the modulation amplitude  $\delta(t)$  is:  $I(t) = I_0 + I_1 \sin(\delta(t)) + I_2 \cos(\delta(t))$  where  $I(t) = A_0 + A_1 \sin t + A_2 \cos t$  a first Fourier-transform processing means analyses the signal  $I(t)$  into Fourier components  $S_0(\omega)$ ,  $S_1(\omega)$ ,  $S_2(\omega)$  at frequency  $\omega$  and at frequency  $2\omega$ , second processing means produces values  $I_0$ ,  $I_1$ ,  $I_2$  from the measured harmonics  $S_0(\omega)$ ,  $S_1(\omega)$ ,  $S_2(\omega)$  according to the following relation: 
$$\begin{pmatrix} S_0(\omega) \\ S_1(\omega) \\ S_2(\omega) \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} J_0(A) \\ J_1(A) \\ J_2(A) \end{pmatrix} + \begin{pmatrix} C_{c,0} \\ C_{c,\omega} \\ C_{c,2\omega} \end{pmatrix} \begin{pmatrix} S_0(\omega) \\ S_1(\omega) \\ S_2(\omega) \end{pmatrix}$$
 where  $J_0$ ,  $J_1$  and  $J_2$  are the Bessel functions of order 0, 1, 2;  $T_1$  and  $T_2$  are specific constant of the detection means and  $C_{c,0}$ ,  $C_{c,\omega}$ ,  $C_{c,2\omega}$  describe the weak coupling between the three Fourier components, the modulation amplitude  $A$  being generally chosen such as  $J_0(A) + C_{c,0} = 0$ ;  $S_1(\omega) \approx T_1 I_1 + C_{c,\omega} I_1$ ;  $S_2(\omega) \approx T_2 I_2 + C_{c,2\omega} I_2$ . The spectroscopic variations of ( $T_1$ ,  $T_2$ ) and ( $C_{c,0}$ ,  $C_{c,\omega}$ ,  $C_{c,2\omega}$ ) are calculated by fitting a polynomial variation to the experimental values measured with the orientations of said

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polarisation state generator, modulator and polarisation state detector, being respectively P, M and A, said calibration is performed according to the configurations P-M=+.45.degree.; A=0.degree., 90.degree.; M=+.45.degree. and P-M=+.45.degree.; A=45.degree.; M=45.degree., third processing means produces the value .psi. and .DELTA. from I.sub.0, I.sub.s, and I.sub.c according to simple trigonometric formulae (Pages 26-28).

And in regards to claim 6, a forth degree polynomial is used for fitting the experimental values ( $T_1$ ,  $T_2$ ,  $C_{c,0}$ ,  $C_{s,0}$ ,  $C_{s,\omega}$ , and  $C_{s,2\omega}$ ) (Columns 58 & 59, Page 27).

Given the teachings of **Johs et al.**, it would to modify the spectrophotometer, ellipsometer, polarimeter and the like systems of **Woollam et al.** with a method of polarimetric measurement according to claim 4, wherein the incident light beam is modulated by a phase modulator at a frequency .omega., the intensity I(t) measured by the detection means as a function of the modulation amplitude .delta.(t) is:  $I(t) = I(I_{sub.0} I_{sub.s} \sin(\delta(t)) + I_{sub.c} \cos(\delta(t)))$  where  $\delta(t) = A_0 + A_1 \sin t + \dots = 2 \sum A_n \sin(n t + \phi_n)$  a first Fourier-transform processing means analyses the signal I(t) into Fourier components S.sub.0(dc), S.sub.1, S.sub.2 at frequency .omega. and at frequency 2.omega., second processing means produces values I.sub.0, I.sub.s, I.sub.c from the measured harmonics S.sub.0, S.sub.1, S.sub.2 according to the following relation: 
$$\begin{pmatrix} S_0 \\ S_1 \\ S_2 \end{pmatrix} = \begin{pmatrix} 1 & 0 & 0 & 0 \\ 2 & T_1 & J_1(A) & 0 \\ 0 & 0 & 0 & 2 \end{pmatrix} \begin{pmatrix} I_0 \\ I_s \\ I_c \end{pmatrix} \begin{pmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{pmatrix} \begin{pmatrix} J_0(A) \\ J_1(A) \\ J_2(A) \end{pmatrix} \begin{pmatrix} 1 & 0 & 1 \\ 0 & 1 & 1 \\ 0 & 1 & 1 \end{pmatrix} \begin{pmatrix} I_0 \\ I_s \\ I_c \end{pmatrix}$$
 where J.sub.0,

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$J_{0,1}$  and  $J_{0,2}$  are the Bessel functions of order 0, 1, 2;  $T_{0,1}$  and  $T_{0,2}$  are specific constant of the detection means and  $C_{c,0}$ ,  $C_{s,0}$ ,  $C_{s,\omega}$  and  $C_{s,2\omega}$  describe the weak coupling between the three Fourier components, the modulation amplitude  $A$  being generally chosen such as  $J_0(A) + C_{c,0} = 0$ :

$$S_{\omega} \approx T_{0,1} I_s + C_{s,\omega} I_c - a I_c$$

$S_{2\omega} \approx T_{0,2} I_c + C_{s,2\omega} I_s$  The spectroscopic variations of ( $T_{0,1}$ ,  $T_{0,2}$ ) and ( $C_{c,0}$ ,  $C_{s,0}$ ,  $C_{s,\omega}$  and  $C_{s,2\omega}$ ) are calculated by fitting a polynomial variation to the experimental values measured with the orientations of said polarisation state generator, modulator and polarisation state detector, being respectively  $P$ ,  $M$  and  $A$ , said calibration is performed according to the configurations  $P-M = \pm 45^\circ$ ;  $A = 0^\circ, 90^\circ$ ;  $M = \pm 45^\circ$  and  $P-M = \pm 45^\circ$ ;  $A = 45^\circ$ ;  $M = 45^\circ$ , third processing means produces the value  $\psi$  and  $\Delta$  from  $I_0$ ,  $I_s$ , and  $I_c$  according to simple trigonometric formulae and a forth degree polynomial is used for fitting the experimental values ( $T_1$ ,  $T_2$ ,  $C_{c,0}$ ,  $C_{s,0}$ ,  $C_{s,\omega}$ , and  $C_{s,2\omega}$ ).

Doing so would allow a processing means that is attuned with the desired calibrations.

11. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Woollam et al.** (6,982,792) in view of **Johs et al.** (6,804,004), and further in view of **Jellison, Jr. et al.** (5,956,147).

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**Woollam et al.** 's invention as further modified by **Joys et al.**, discloses all of the claimed limitations above except the frequency of said modulator is between 30 and 60 kHz.

However, **Jellison, Jr. et al.** teaches in regards to claim 7, the frequency of said modulator is between 30 and 60 kHz (Column 5, lines 3-6 and Fig. 2).

Given the teachings of **Jellison, Jr. et al.**, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the spectrophotometer, ellipsometer, polarimeter and the like systems of **Woollam et al.** with the frequency of said modulator is between 30 and 60 kHz.

Doing so would allow a modulation anywhere in that designated range of Hertz.

12. Claims 10-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Woollam et al.** (6,982,792) in view of **Jellison, Jr. et al.** (5,956,147), and furthermore in view of **Verentchikov et al.** (6,504,150).

**Woollam et al.** 's invention, as furthermore modified by **Jellison, Jr. et al.**, discloses all of the claimed limitations above except pumping station comprises at least a primary pump, the polarimetric system comprises heating means for heating said chambers or for the thermal stability of the optical components, and the polarimetric system contains control means for regulating the temperature of the heating means with predetermined temperature range.

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However, **Verentchikov et al.** teaches, in regards to claim 10, pumping station comprises at least a primary pump (Column 6, lines 6-12).

In regards to claim 11, the polarimetric system comprises heating means 19 for heating said chambers 14b or for the thermal stability of the optical components (Column 9, lines 22-26 and Figs. 1-3).

And in regards to claim 12, the polarimetric system contains control means for regulating the temperature of the heating means 19 with predetermined temperature range (Column 3, lines 31-37 and Figs 1 & 2).

Given the teachings of **Verentchikov et al.**, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the spectrophotometer, ellipsometer, polarimeter and the like systems of **Woollam et al.** with pumping station comprises at least a primary pump, the polarimetric system comprises heating means for heating said chambers or for the thermal stability of the optical components, and the polarimetric system contains control means for regulating the temperature of the heating means with predetermined temperature range.

Doing so would reduce losses and breaks up complexes of sample ions, as disclosed by **Verentchikov et al.**

13. Claim 19 is rejected under 35 U.S.C. 103(a) as being unpatentable over **Woollam et al.** (6,982,792) in view of **Verentchikov et al.** (6,504,150), and furthermore in view of **Johs et al.** (6,804,004).

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**Woollam et al.** 's invention, as furthermore modified by **Verentchikov et al.**, discloses all of the claimed limitations above except that the focusing means comprises an  $\text{MgF}_2$  lens or another FUV transparent material.

However, **Johs et al.** teaches, in regards to claim 19, said focusing means comprises a  $\text{MgF}_2$  lens or another FUV transparent material (Column 41, lines 1-7).

Given the teachings of **Johs et al.**, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the spectrophotometer, ellipsometer, polarimeter and the like systems of **Woollam et al.** with a focusing means that comprises a  $\text{MgF}_2$  lens or another FUV transparent material.

Doing so would allow the lens coating to be an optimal bi-refrangent surface.

14. Claims 20-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over **Woollam et al.** (6,982,792) in view of **Johs et al.** (6,804,004), and furthermore in view of **Wollmann et al.** (6,449,036).

**Woollam et al.**'s invention, as furthermore modified by **Johs et al.** discloses all of the claimed limitations above except the detection means comprises a first detector covering radiations in the spectral range from visible to ultraviolet and a second detector for radiations in the far ultraviolet spectrum, a diaphragm is located in front of the first detector and the second detector in order



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to reject parasitic beams, said optical means comprises concave mirrors and said concave mirrors are coated with a protecting layer, said layer being  $\text{MgF}_2$ .

However, **Wollmann et al.** teaches, in regards to claim 20, the detection means comprises a first detector 15 covering radiations in the spectral range from visible to ultraviolet and a second detector 20 for radiations in the far ultraviolet spectrum (Column 9, lines 18-23).

In regards to claim 21, a diaphragm 30 is located in front of the first detector 15 and the second detector 20 in order to reject parasitic beams (Column 20, lines 11-13 and Figs. 1-3).

In regards to claim 22, said optical means comprises concave mirrors 1 (Column 13, lines 7-10).

And in regards to claim 23, said concave mirrors are coated with a protecting layer, said layer being  $\text{MgF}_2$  (Column 39, lines 62-66 and Fig. 1a<sub>2</sub>).

Given the teachings of **Wollmann et al.**, it would have been obvious to one of ordinary skill in the art at the time of the invention to modify the spectrophotometer, ellipsometer, polarimeter and the like systems of **Wollam et al.** with the detection means comprises a first detector covering radiations in the spectral range from visible to ultraviolet and a second detector for radiations in the far ultraviolet spectrum, a diaphragm is located in front of the first detector, the second detector in order to reject parasitic beams and said optical means comprises concave mirrors and said concave mirrors are coated with a protecting layer, said layer being  $\text{MgF}_2$ .

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Doing so would allow the multiple beams that a reflected from the sample's surface, to be detected by more than one detector.

### ***Conclusion***

15. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. **6,664,954.**

Any inquiry concerning this communication or earlier communications from the examiner should be directed to IYABO S. ALLI whose telephone number is 571-270-1331. The examiner can normally be reached on M-Th 7:30am-5:00pm; 1st F-OFF & 2nd F- 7:30-4pm.

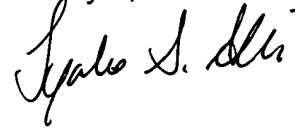
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Terrell McKinnon can be reached on 571-272-4797. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Examiner  
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January 3, 2006



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